



TE TĀHUHU O TE MĀTAURANGA

Ministry of Education

Hei Tautoko i te Marautanga Pāngarau

# Te Wahi, te Ahunga me te Panoni



## He Kupu Whakataki

Ko te kaupapa ia o tēnei pukapuka, ko te āta whakaatu i ngā ariā matua<sup>1</sup> o ēnei wāhanga o te āhuahanga<sup>2</sup>, arā, te wāhi<sup>3</sup>, te ahunga<sup>4</sup> me te panoni<sup>5</sup>, me ngā whanaketanga ako, e eke ai ā tātou ākonga i ngā taumata o tēnei wāhanga o te pāngarau. Āpiti atu ki tēnā, ko te whakaatu i ētahi ngohe e hāngai ana ki tēnā taumata ki tēnā taumata o te marautanga, me ngā hononga ki Ngā Whanaketanga Pāngarau o Aotearoa\*.

<sup>1</sup>big ideas  
<sup>2</sup>geometry,  
<sup>3</sup>position, <sup>4</sup>direction,  
<sup>5</sup>transformation

He mea tuhi tēnei pukapuka i te tau 2010 hei āwhina i te whakaūnga o Ngā Whanaketanga Pāngarau i ō tātou kura reo Māori. Ko te whakaaro kia noho tauira tonu tēnei pukapuka mō tētahi wā, waihoki ka tāpiri haerehia ētahi atu ngohe, ētahi atu whakamārama ka puta i ngā kura me ngā kaitakawaenga i ngā tau e rua e tū mai ana.

He mea nui tonu te reo whakamārama i te wāhi e noho ana tētahi mea, i te ahunga o tētahi mea, me ngā momo panoni e puta ai he mātātuhī<sup>6</sup> i tētahi mātāoroko<sup>7</sup>. Āpiti atu ki te reo, ko ngā whakaahuahanga<sup>8</sup> pāngarau me ngā momo pūnaha<sup>9</sup> pērā i te tukutuku<sup>10</sup>, ngā ahunga o te kāpehu me te pere<sup>11</sup>.

<sup>6</sup>image  
<sup>7</sup>object, <sup>8</sup>representation  
<sup>9</sup>system, <sup>10</sup>grid  
<sup>11</sup>vector

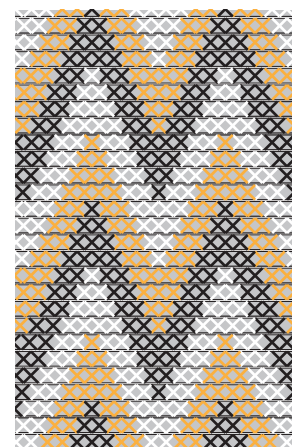
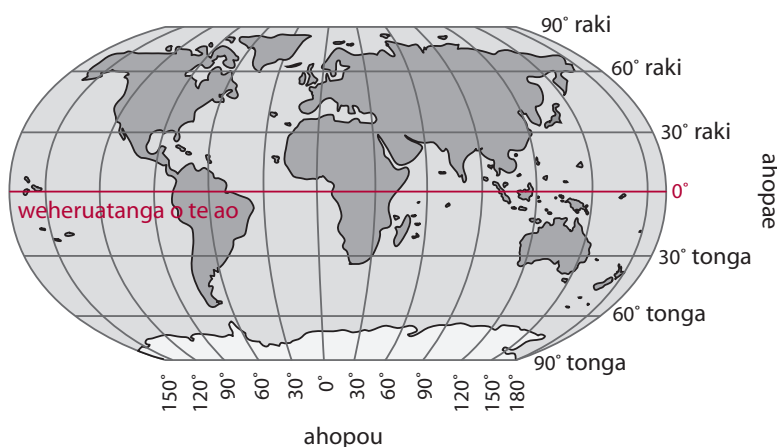
Kāore e kore kua rongu te hunga nohinohi i ngā kupu pēnei i te *runga*, te *mai* me te *atu*, te *teitei* me te *pāpaku*, i mua i tō rātou tīmatanga ki te kura, engari kāore pea ētahi i te tino mātau ki ngā tikanga o aua kupu. Nō reira, e tika ana kia rongu rātou i ēnei kupu e hāngai ana ki te wāhi te ahunga me te panoni, e whakamahia ana i roto i ngā horopaki<sup>12</sup> whaitake, me te whai wāhi anō ki te whakamahi i aua kupu. Mā konei e tino mātau ai rātou ki ēnei momo kupu.

<sup>12</sup>context

Arā atu, arā atu ngā pūāhua whaitake<sup>13</sup> e whakamahia ana tētahi pūnaha hei whakaatu i te wāhi noho me te ahunga o tētahi mea. Hei tauira, ko te ripanga rorohiko<sup>14</sup>, ko te mahere whenua, ko te tohutohu hurarahi. He mea nui kia taunga ngā ākonga ki te whakamahi i ēnei momo pūnaha, me te aha, ka pai noa iho tā rātou urutomo atu ki ērā pūāhua whaitake.

<sup>13</sup>practical situation  
<sup>14</sup>computer spreadsheet

I roto i ngā mahi toi a te Māori, e tino kitea ana ngā momo panoni, e hua mai ai tētahi tauira, pērā i te kōwhaiwhai, te tukutuku me te tāniko. Koia rā tētahi horopaki matua e taunga ai ngā ākonga ki tēnei wāhanga o te pāngarau.



\* Tirohia: *Whanaketanga Pāngarau: He aratohu mā te pouako*. Te Whanganui-ā-Tara: Te Tāhuhu o te Mātauranga. He Tauira Noa 2010.

## **Hei Whakamihi**

Nā He Kupenga Hao i te Reo ngā tuhinga o tēnei pukapuka. E whakamihi ana ki ngā puna kōrero e whai ake nei, inā te ohonga ake o te hinengaro.

*Te Reo Pāngarau: Putanga Tuarua.* (2010). Papaioea: He Kupenga Hao i te Reo.

Van de Walle, J.A. (2007). *Elementary and Middle School Mathematics: Teaching Developmentally*. Boston: Pearson.

Ngā rauemi katoa o Te Poutama Tau

Ngā rauemi o <http://www.nzmaths.co.nz/>

## Te Wāhi, te Ahunga me te Panoni: He Tauira Mahere

Taumata 1	Te Mātauranga	Te Whakaoti Rapanga	Te Reo Matatini
Whanaketanga 1a	<p>E mōhio ana ki te whakamārama i te wāhi noho me te ahunga o tētahi mea i runga anō i te hononga ki tētahi atu mea. Hei tauira:</p> <ul style="list-style-type: none"> <li>• Kei te taha mauī o te pukapuka te pene.</li> <li>• Kei tua atu o te kokonga a Piripi e tatari mai ana.</li> <li>• E titiro atu ana ia ki te maunga.</li> </ul>	<p>Ka whakamārama i te wāhi noho me te ahunga o tētahi mea.</p> <p>Ka whai, ka hoatu i ngā tohutohu māmā mō te neke.</p>	<p>E mōhio ana ki ngā kupu tūwāhi māmā o ia rā. Hei tauira: tata, mua, muri, taha, taha mauī, taha matau, waenganui, pito, tua atu, tua mai, runga, raro, roto, waho, tuatahi, tuarua ...</p> <p>E mōhio ana ki ngā kupu māmā mō te ahunga. Hei tauira: mai, atu, ki runga/ raro/tua ..., whakamua, whakamuri ...</p>
Whanaketanga 1e	<p>Ka tautohu i te kauhuringa (huripokinga, whakaatanga) o tētahi āhua māmā.</p> <p>Ka tautohu i te hurihanga o tētahi āhua māmā.</p>	<p>Ka whakaroa i tētahi tauira tāruarua e whai wāhi mai ana tētahi panoni māmā.</p> <p>Ka whai, ka hoatu i ngā tohutohu māmā mō te hurihanga.</p>	<p>E mōhio ana ki ngā kupu ahunga: whakatekaraka, kōaro, poutū, huapae, ahu (~nga)</p>

Taumata 2	Te Mātauranga	Te Whakaoti Rapanga	Te Reo Matatini
Whanaketanga 2a	<p>E mōhio ana ki te hangarite o tētahi āhua māmā.</p> <p>E mōhio ana ki ngā āhua hangarite-kore.</p> <p>E mōhio ana ki ngā āhuatanga o te tukutuku, pēnei i te kapa, te pou, te rārangi poutū me te rārangi huapae.</p> <p>E mōhio ana ki ngā ahunga matua e whā o te kāpehu.</p>	<p>Ka whakaatu i ngā rārangi hangarite o tētahi āhua māmā.</p> <p>Ka whakamārama i te wāhi noho o tētahi mea ki tētahi tukutuku.</p> <p>Ka whakamārama i tētahi ara neke i tētahi tukutuku.</p> <p>Ka tautohu i te whakaatanga, te nekenga, te hurihanga, me te whakarahinga o tētahi āhua māmā.</p>	<p>E mōhio ana ki ngā kupu nei e hāngai ana ki te tukutuku: pou, kapa, huapae, poutū.</p> <p>E mōhio ana ki ngā kupu mō ngā ahunga matua e whā, me te tohu i ēnei ahunga ki te pepa: raki, rāwhiti, tonga, uru.</p> <p>E mōhio ana ngā kupu nei e pā ana ki ngā panoni: hangarite, rārangi hangarite, whakaatanga rārangi whakaata, hurihanga, pū hurihanga, nekenga.</p>
Whanaketanga 2e	<p>E mōhio ana ki ngā ahunga matua o te takiwā o te kura me te kāinga.</p> <p>E mōhio ana ki ngā āhuatanga ka noho pūmau me ngā āhuatanga ka rerekē i muri i te whakaatanga, te hurihanga, te nekenga me te whakarahinga o tētahi āhua māmā.</p>	<p>Ka whai, ka hoatu tohutohu huarahi.</p> <p>Ka tuhi tauira māmā o te whakaatanga, te nekenga, te hurihanga me te whakarahinga.</p> <p>Ka tuhi mahere māmā o tētahi wāhi e mōhiotia ana (pērā i te takiwā o te kura).</p>	<p>Ka whakaatu huarahi māmā ki te mahere huarahi.</p> <p>E mōhio ana ki ngā kupu ahunga nei: whakateraki, whakaterāwhiti, whakatetonga, whakateuru</p>

Taumata 3	Te Mātauranga	Te Whakaoti Rapanga	Te Reo Matatini
Whanaketanga 3a	<p>E mōhio ana ki ngā tikanga o te pūnaha tukutuku hei whakaatu taunga, hei whakaatu ara hoki. Hei tauira, ko te takirua raupapa.</p> <p>E mōhio ana ki ngā ahunga matua e waru o te kāpehu.</p>	<p>Ka whai, ka hoatu tohutohu mō te tuhi āhua ahu-2 ki te papa tukutuku.</p> <p>Ka whakarahi āhua ki te papa tukutuku.</p> <p>Ka whai, ka hoatu tohutohu e whai wāhi mai ana te mahere me te pūnaha tukutuku hei whakaatu taunga, ara anō hoki.</p> <p>Ka whakamahi i ngā ahunga matua e waru o te kāpehu hei whakamārama i te takoto o te whenua me ōna āhuatanga.</p>	<p>E mōhio ana ki ngā ahunga kei waenganui i ngā ahunga matua e whā o te kāpehu, me te tikanga hei tohu i ērā ahunga ki te mahere:</p> <p>rāwhiti mā raki, rāwhiti mā tonga, uru mā tonga, uru mā raki.</p> <p>E mōhio ana ki te tuhinga o te takirua raupapa me tōna tikanga,</p>
Whanaketanga 3e	<p>E mōhio ana ki ngā tikanga mō te whakamārama i tētahi whakaatanga, tētahi hurihanga, tētahi nekenga, me tētahi whakarahinga.</p>	<p>Ka whiriwhiri i te pūwaenga o tētahi rārangi kua tuhia ki te papa tukutuku.</p> <p>Ka whakaoti, ka whakamārama panoni.</p> <p>Ka whai, ka whakamārama tohutohu mō ngā panoni tāruarua e hua mai ai he tauira.</p>	<p>E mōhio ana ki ngā kupu hei whakamārama panoni. Hei tauira: pū hurihanga, rārangi whakaata, taurahi, pū whakarahi, mātāoroko, mātātuhi</p>

Taumata 4	Te Mātauranga	Te Whakaoti Rapanga	Te Reo Matatini
Whanaketanga 4a	<p>E mōhio ana ki te hononga o ngā ahunga matua o te kāpehu me ngā inenga koki.</p> <p>E mōhio ana ki ngā tikanga o te hangarite rārangi me te hangarite hurihanga o tētahi āhua.</p>	<p>Ka tuhi hoahoa āwhata.</p> <p>Ka whakamahi ine-koki hei tautohu, hei whakaatu ahunga ki te mahere.</p> <p>Ka whakamahi i te āwhata me te rūri (te tāporowhita rānei) hei tautohu, hei whakaatu tawhiti ki te mahere.</p>	<p>E mōhio ana ki ngā momo tikanga hei whakaatu i te āwhata o tētahi mahere:</p> <ul style="list-style-type: none"> <li>• āwhata tauākī;</li> <li>• āwhata rārangi;</li> <li>• āwhata ōwehenga.</li> </ul> <p>E mōhio ana ki te tikanga whakaatu i te ahunga kāpehu, pēnei i te 045° mō te rāwhiti mā raki.</p>
Whanaketanga 4e	<p>E mōhio ana ki te pānga o te taurahi ki te horahanga me te rōrahi o te mātātūhi i muri i te whakarahinga.</p>	<p>Ka whakaoti, ka whakamārama raupapatanga panoni, pēnei i te whakaata nekehanga.</p>	<p>E mōhio ana ki ngā kupu me ngā momo tohu hei whakaatu i tētahi raupapatanga panoni. Hei tauira, ko te pūtaketake (o tētahi tauira), ko te pere hei whakaatu nekehanga, ko te rārangi iraira hei whakaatu rārangi whakaata ...</p>

Taumata 5	Te Mātauranga	Te Whakaoti Rapanga	Te Reo Matatini
Whanaketanga 5	<p>Ka mōhio ki ngā tikanga o te pere hei whakaatu nekehanga.</p> <p>Ka mōhio ki ngā tikanga o ngā rohe e whā o te papa kauwhata.</p>	<p>Ka whakamahi i ngā tikanga o te pere hei whakamārama, hei whakaatu nekehanga ki te mahere, ki te papa tukutuku rānei.</p> <p>Ka whakaatu taunga, whakaatu panoni, whakaatu ara ki ngā rohe e whā o te papa kauwhata.</p>	<p>E mōhio ana ki ngā whakaahuanga (tuhinga poto) o tētahi pere.</p>